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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 23

Application Number: 09/086,627
Filing Date: May 29, 1998
Appellant(s): BOLAND, VERNON K.

Kenneth M. Berner, Registration No. 37,093
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on April 29, 2002.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims of Group I: 1-5, 9-13, and 15; claims of Group II: 14; Claims of Group III: 16, and Claims of Group IV: 7, do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

U.S. Patent No. 5,838,968, Culbert, filed Mar. 1, 1996, issued Nov. 17, 1998.

U.S. Patent No. 5,522,070, Sumimoto, filed May 23, 1995, issued May 28, 1996.

U.S. Patent No. 5,889,956, Hauser et al., filed Jul. 18, 1996, issued Mar. 30, 1999.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

A. Claims 1-5 and 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Culbert (U.S. Patent No. 5,838,968), in view of Sumimoto (U.S. Patent No., 5,522,070).

In considering claims 1, 11, 12, and 13, Culbert discloses a method, a computer architecture, a computer system, and an article comprising machine executable instructions, for allocating resources on a computer, comprising:

means for monitoring at least two resources on the computer among at least a first process and a second process for allocation of computer resources on the computer ("resource manager 170" - col. 6, line 51 - col. 7, line 12);

means for assigning a priority to each of the at least two processes, the second process being assigned a lower priority than the first process (col. 9, lines 24-36);

for the first process, means for setting a minimum resource allocation for the first process independent of the computer resources needed by other processes running on the computer (col. 7, lines 49-51; col. 8, lines 33-37; col. 9, lines 35-36, 54-55; col. 11, lines 5-6; wherein a task specifies a required amount of necessary resources that cannot be removed); and

means for redistributing computer resources on the computer so that the minimum resource allocation is guaranteed should insufficient resources be available (col. 9, lines 36-54, "while still providing the needed resources").

However, the system taught by Culbert does not disclose that the resources are distributed across a network, including at least two nodes. Nonetheless, systems for managing resource allocation for processes distributed across a network or multiple computers are well known, as evidenced by Sumimoto (see Abstract). Given the teaching of Sumimoto, it would have been obvious to a person having ordinary skill in the art to use the resource allocation scheme taught by Culbert for processes and resources distributed throughout a network, as taught by Sumimoto, so that the most important network distributed processes can be assured available resources.

In considering claim 2, Sumimoto further discloses the allocation being an allocation of computers and memory space on the network for the first process (col. 17, lines 57-63).

In considering claim 3, Sumimoto further discloses denoting usage of resources as a percentage (col. 16, lines 11-12). Therefore, it would have been obvious to denote the minimum allocation, as taught by Culbert, as a percentage of the resources, to insure that a minimal amount of processing power on each resource is wasted.

In considering claim 4, Culbert further discloses performing the monitoring step periodically (col. 8, lines 47-48).

In considering claim 5, Culbert further discloses that monitoring of the resources is performed continually (col. 8, lines 53-57). Sumimoto further discloses denoting usage of resources as a percentage. Therefore, it would have been obvious to denote the minimum allocation, as taught by Culbert, as a percentage of the resources, to insure that only a minimal amount of processing power on each resource is wasted.

In considering claim 9, Culbert further discloses storing the minimum resource allocation in a storage device (col. 8, lines 25-28; wherein the allocation is stored in the utilization records, which are inherently stored on a storage device).

In considering claim 10, Sumimoto further discloses monitoring being performed by any of the nodes on the computer network (Fig. 3, Fig. 22, col. 17, lines 57-60, "LM").

In considering claim 14, Culbert further discloses redistributing including removing a computer resource previously assigned to the second process (i.e. degrading) and reallocating the removed computer resource to the first process (i.e. "priority," col. 9, lines 15-47). However, this is not done wholly irrespective of an amount of computer resources necessary for the second process to run on the computer network. Instead, if the resources on the system are completely filled and cannot be degraded any further, the resource allocation may be denied. However, this is a mere design choice. Culbert discloses allowing minimum resource allocation for processes, wherein a resource manager "*must reserve* resources for the worst-case usage scenario of [particular] tasks." (emphasis added) See col. 8, lines 19-32. Thus, one having ordinary skill in the art would have readily recognized that certain tasks may be of such utmost importance that it would be desirable to completely disregard lower priority processes and simply supply the required resources to the high priority task. Such a design choice would have been obvious in order to provide resource allocation for extremely important tasks that must be processed above all else.

In considering claim 15, Culbert further discloses that the assigning step is performed irrespective of amounts of computer resources necessary for each of the at least two processes to run on the computer network (col. 9, lines 24-26; assigning priorities is not related to the minimum required resource).

Claim 16 contains similar limitations to claims 13 and 14 combined, and is thus rejected under the same rationale.

B. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Culbert, in view of Sumimoto, and further in view of Hauser et al. (U.S. Patent No. 5,889,956, hereinafter "Hauser").

In considering claim 7, although the combined teaching of Culbert and Sumimoto discloses substantial features of the claimed invention, it fails to disclose setting a maximum resource allocation for the processes. Nonetheless, setting maximum resource allocation for processes using resources across a network is well known, as evidenced by Hauser. In a similar art, Hauser discloses a resource allocation system, which includes setting a maximum resource allocation for at least one process (col. 4, lines 53-56). Given the teaching of Hauser, a person having ordinary skill in the art would have readily recognized the desirability and advantages of including a maximum resource allocation, as taught by Hauser, in the system taught by Culbert and Sumimoto so that no one process could overwhelmingly occupy the system's resources. Therefore, it would have been obvious to include maximum resource allocation, as taught by Hauser, in the system taught by Culbert and Sumimoto.

(11) Response to Argument

In response to Applicant's appeal brief filed on April 29, 2002, the following factual arguments are noted:

a. The applied patents, especially Culbert, fail to disclose, teach or suggest all limitations of claim 1, especially the feature that minimum resource allocation for the first (higher-priority) process is **guaranteed** should insufficient network resources be available.

b. Regarding claims 14 and 16, the applied references, especially Culbert, fail to disclose, teach or suggest redistributing an amount of resources previously assigned to a second (lower-priority) process, and reallocating the resource to a first (higher-priority) process, **irrespective or regardless of** an amount of computer resources **necessary for the second process to run** on the computer network.

Applicant has also argued the following:

c. Regarding claims 14 and 16, given the teaching of the cited references and the knowledge generally available in the art, a skilled artisan would not have been motivated to modify the Culbert system to reallocate computer resources in the claimed manner.

In considering (a), Applicant contends that the applied patents, especially Culbert, fail to disclose, teach or suggest all limitations of claim 1, especially the feature that minimum resource allocation for the first (higher-priority) process is **guaranteed** should insufficient network resources be available. Examiner respectfully disagrees. Culbert states that "tasks have three classes, error intolerant, error-tolerant realtime, and non-realtime. To guarantee proper functioning of error intolerant tasks, the

resource manager must reserve resources for the worst-case usage scenario of these tasks." Column 8, lines 19-23. Thus, Culbert discloses a minimum guaranteed resource allocation for error intolerant (i.e. highest priority) tasks. Culbert further discusses the prioritization scheme and the method used to guarantee resources to the highest priority tasks, wherein degradation of low priority tasks is one method for guaranteeing resource allocation to higher priority tasks. See column 9, lines 24-54.

Applicant further argues that because the system taught by Culbert may deny a request for a resource if there are insufficient resources available, it thus does not absolutely guarantee resource allocation to high priority requesting processes. Examiner agrees. However, this would be the case in any resource allocation system, including Applicant's invention. Resources are never infinite, and requests for resources must be denied when the resources run out. Thus, the notion of *guaranteeing* resources is merely one of degree, or perhaps only theory – resources can only be guaranteed up to the point where they run out. For example, in Applicant's invention, a requesting high-priority process may have priority over an allocated low-priority process, but may still not obtain the necessary resources because the resources available to fulfill the request will be insufficient, even after the low-priority process is removed. Culbert works the same way – it attempts to remove all lower priority allocated resources to allow for higher-priority allocation, but will deny the request if after doing so, the available resources are still insufficient.

Thus, the system taught by Culbert does in fact "guarantee" resources for high-priority processes to the same extent as Applicant's claimed invention.

In considering (b), Applicant contends that regarding claims 14 and 16, the applied references, especially Culbert, fail to disclose, teach or suggest redistributing an amount of resources previously assigned to a second (lower-priority) process, and reallocating the resource to a first (higher-priority) process, **irrespective or regardless of** an amount of computer resources **necessary for the second process to run** on the computer network. Examiner respectfully disagrees. Culbert clearly discloses redistributing previously assigned resources to accommodate for higher-priority processes (col. 9, lines 24-40). Although Culbert does not explicitly state that higher-priority processes are allocated resources *irrespective of an amount necessary for lower-priority processes*, it does suggest such a scheme in two ways.

First, Culbert discloses that certain requesting tasks are "error intolerant" and must be guaranteed a minimum level of resources in order to run properly. See col. 8, lines 19-23. Instead of *completely* removing resources from lower priority (but still important) tasks, the Culbert system attempts to salvage a small amount of resources for lower priority tasks so that these tasks can still run, albeit at a minimal level. Nonetheless, the simple fact that the Culbert system includes "error intolerant" tasks would suggest to a person having ordinary skill in the art the possibility of modifying the Culbert system to allow such tasks to completely override the lower priority tasks (even past their minimal level). One would be motivated to allow this so that extremely important tasks that cannot be compromised will still be given resources even in a nearly fully utilized system.

Second, Culbert also discloses that certain tasks that have already been allocated resources, may "respond that [they] cannot be changed, and cannot give up any resources." Col. 11, lines 5-6. Such tasks are thus guaranteed minimum resources irrespective of any other task that may request resources. A person having ordinary skill in the art would have readily recognized the reverse process of allowing the *requesting* task to gain a minimum guaranteed resource over an already allocated task, irrespective of that task, because the requesting task may be far more important. Thus, it would have been obvious to a person having ordinary skill in the art to modify the Culbert system to allow requesting processes to completely override already-allocated processes, as suggested in the claims, because it may be of utmost importance to allocate resources to the requesting processes.

Thus, the Culbert reference itself suggests Applicant's claimed invention, and it would have been obvious to a person having ordinary skill in the art to modify the Culbert system in the manner claimed by Applicant, for the reasons stated above.

In considering (c), Applicant contends that regarding claims 14 and 16, given the teaching of the cited references and the knowledge generally available in the art, a skilled artisan would not have been motivated to modify the Culbert system to reallocate computer resources in the claimed manner. Examiner respectfully disagrees, and believes that this issue has already been addressed in section (b) above. Primarily, one would be motivated to modify the Culbert system to reallocate resources in the claimed manner in order to ensure resource allocation for extremely important tasks.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Bradley Edelman, Patent Examiner
July 16, 2002

Conferees

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